



SC DEPARTMENT of
**ENVIRONMENTAL
SERVICES**

**Proposed Plan for Site Remediation
Former Ducane Company**
118 West Main Street, Blackville, South Carolina,

January 2025

ANNOUNCEMENT OF PROPOSED PLAN

The South Carolina Department of Environmental Services (SCDES) has completed an evaluation of cleanup alternatives to address contamination at the Former Ducane Company Site (the Site). This Proposed Plan identifies SCDES's Preferred Alternative for cleanup and provides the reasoning for this preference. In addition, the Proposed Plan includes summaries of the other cleanup alternatives evaluated during the process. These alternatives were identified based on information gathered during environmental investigations conducted at the Site since 1999.

SCDES is presenting this Proposed Plan to inform the public of activities conducted at the Site, gain public input, and fulfill the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan or NCP). This Proposed Plan summarizes information that can be found in greater detail in the revised Focused Feasibility Study (November 2023) and other documents contained in the Administrative Record. SCDES encourages the public to review these documents to gain an understanding of the Site and the activities that have been completed.

SCDES will select a final cleanup remedy after reviewing and considering comments submitted during the public comment period. SCDES may modify the Preferred Alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the alternatives presented in this Proposed Plan.

SCDES's Preferred Cleanup Summary Alternative 4: ISCR, EB, and MNA

SCDES's preferred remedial option is:

- Injection of In-Situ Chemical Reduction (ISCR) and Enhanced Bioremediation (EB) into the groundwater to promote biodegradation of contaminants.
- This alternative would reduce potential exposure to chemicals of concern (CoCs) and control potential migration by treating the groundwater with chemical reducing agents and enhancing biological degradation.

MARK YOUR CALENDAR

❑ PUBLIC MEETING:

SCDES will hold an in person public meeting to further explain the Proposed Plan and all the alternatives presented in the Remedial Alternatives Evaluation and answer questions.

Public Meeting will be held on January 30, 2025 at 6pm at
Blackville Community Center
19464 Solomon Blatt Avenue
Blackville, South Carolina

Link to Site's Webpage:

www.des.sc.gov/FormDucane

❑ PUBLIC COMMENT PERIOD:

January 30 through March 17, 2025

SCDES will accept written comments on the Proposed Plan during the public comment period. Please submit your written comments to:

Kylie Moore, Project Manager
SCDES Bureau of Land & Waste Management
2600 Bull Street
Columbia, SC 29201
kylie.moore@des.sc.gov

❑ FOR MORE INFORMATION:

Call: Kylie Moore, Project Manager, 803-898-0723

See: SCDES's website at:
www.des.sc.gov/FormDucane

View: The Administrative Record at the following locations:

SCDES's Freedom of Information Office
2600 Bull Street, Columbia, SC
(803) 898-3882
Monday - Friday: 8:30 am - 5:00 pm

SITE HISTORY

The Ducane Company property (Site) is located at 118 West Main Street, Blackville, Barnwell County, South Carolina and consists of approximately 105 acres with roughly 19 acres originally developed as a production building and a research and development building. The main structures were a production building ~375,000 square feet in size and a research and development building ~13,000 square feet in size. The northern portion of the site is primarily wooded with an access road located along the east property line. In 1968, Ducane began operations at the Site manufacturing gas grills, furnaces, and air conditioners and ceased operation in 1999. In 1999, Lennox International Inc. acquired Ducane Company. Lennox International Inc. entered into a Responsible Party Voluntary Cleanup Contract (VCC 16-5848-RP) with the South Carolina Department of Health and Environmental Control (SCDES's predecessor agency) on November 17, 2016. The site is currently owned by Barnwell County Economic Development Corporation and is being leased out to Pine View Buildings for warehouse storage for their wooden building production.

Environmental assessment and remediation activities have been conducted at this site since 1999. During the assessments at the Site, chlorinated volatile organic compounds (CVOs) and aromatic hydrocarbons were detected in the soil and groundwater. The chemicals of concern (CoCs) at the Site are tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), 1,1-dichloroethylene (1,1-DCE), Vinyl Chloride (VC), 1,1,2-trichloroethane (1,1,2-TCA), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethane (1,1-DCA), and 1,4-dioxane. During the assessments there were five areas of concern identified based on historical releases. These areas include: the materials receiving area, west loading dock, drum storage area, old paint system, and former paint system. There have been nine in-situ chemical oxidation/bio-remediation injections conducted at different areas of concern between May 2001 and April 2008 to address CoCs at the Site. There has been a significant reduction in concentrations of the CoCs since the implementation of the injections, currently CoCs are still present above the EPA Maximum Contaminant Levels (MCLs).

The Proposed Plan is addressing the contamination in the groundwater, since assessment has not shown significant soil contamination.

AREAS OF CONCERN

The contamination at the Site appears to have occurred as result of historical releases, and not ongoing operations. The Site's areas of concern are located beneath and around the production building, including the drum storage area which is located east of the building. Groundwater treatment will focus on areas East, North, and South of the production building as well as beneath the production building. These areas correspond to the locations of the highest levels of groundwater contamination at the Site.

SUMMARY OF SITE RISKS

The Site is currently leased to Pine View Buildings for warehouse storage for their wooden building production. Current risk would consist of the Site workers coming into contact with the contaminated groundwater.

The primary concern at the site is the volatile organic compounds (VOCs) contaminants present in groundwater above the MCLs. Contamination from operations at the Former Ducane site has been released to the groundwater. The groundwater is currently not being used at the site. The Site is using municipal water as the source of drinking water, so the groundwater exposure pathway is incomplete. The VOCs in groundwater present the possibility of subsequent media pathways from groundwater migration to surface water.

The primary risk to the public is from direct ingestion or exposure to contaminated groundwater; however, the groundwater plume is currently contained on-site and does not threaten any drinking water wells. The primary risk to the environment is the potential for contaminated groundwater migrating to surface water. The Alternatives identified in this Proposal Plan and evaluated in the Feasibility Study are necessary to protect public health and the environment from actual or threatened releases of hazardous substances to the environment.

CLEANUP GOALS

Remedial action objectives (RAOs) are developed to set goals for protecting human health and the environment. The goals should be as specific as possible but should not unduly limit the range of remedial alternatives that can be developed. The remedial action objectives for the site are to reduce the mass of chemicals of concern in groundwater and to reduce the potential for off-site migration of chemicals of concern in groundwater to adjacent surface water. Accordingly, the following RAOs were developed for the Site:

- Prevent ingestion of groundwater with concentrations of chemical CoCs above applicable drinking water standards.
- Reduce source area groundwater impacts to further mitigate/control impacts to downgradient groundwater and surface water.
- Restore groundwater to maximum contaminant levels.

SCOPE AND ROLE OF THE ACTION

The proposed action in this Proposed Plan will be the final cleanup action for the Site. The remedial action objectives for this proposed action include the follow preventing ingestion of groundwater with concentrations of CoCs above applicable drinking water standards, to restore the groundwater concentrations to applicable remediation goals, and to prevent migration of contaminated groundwater. As contamination will remain onsite, a 5-year review will be required once the remedial action is conducted, to evaluate the effectiveness of the remedy.

SUMMARY OF REMEDIAL ALTERNATIVES

Based on information collected during previous investigations, a *Revised Focused Feasibility Study* (WSP, November 2023) was developed to identify and evaluate cleanup options to address the contamination at the Site. This evaluation considered the nature and extent of contamination and associated potential risks identified during the remedial investigations and the previous in-situ events to determine and evaluate potential remedial alternatives and their overall protection of human health and the environment. Each remedial alternative evaluated by the Department is described briefly below. Note: A final Remedial Design will be developed prior to implementation of any alternative after a Final Remedy has been selected.

Remedial Alternatives	Description
1-No Action	<ul style="list-style-type: none">• No remedial action for soil• No remedial action for groundwater• Cost \$0
2-Monitoring Natural Attenuation (MNA)	<ul style="list-style-type: none">• Monitoring the natural degradation of chemical of concerns (CoCs) in groundwater with existing monitoring network• Implement restrictions on land and groundwater use at the site• Cost: ~\$280,000
3-In-Situ Chemical Reduction (ISCR) and Monitoring Natural Attenuation (MNA)	<ul style="list-style-type: none">• Injection of reducing agents that help change the contaminants into less toxic forms.• Monitor natural degradation of COCs in groundwater to address any residual contamination following in-situ remediation of the groundwater.• Cost: ~\$1,500,000
4-In-Situ Chemical Reduction (ISCR), Enhanced Bioremediation (EB), and Monitoring Natural Attenuation (MNA)	<ul style="list-style-type: none">• Injection of reducing agents that help change the contaminants into less toxic forms.• Enhanced bioremediation would stimulate the naturally occurring subsurface microbial processes to degrade the COCs.• Monitor natural degradation of COCs in groundwater to address residual contamination following in-situ remediation of the groundwater.• Cost: ~\$1,700,000

DESCRIPTION OF ALTERNATIVES

Alternative 1 - No Action

The No Action alternative is included as a baseline for comparison with other Alternatives. Under this remedial alternative, there would be no groundwater monitoring nor any further active remedial treatment measures. There is no cost associated with implementing this alternative.

Alternative 2– Monitored Natural Attenuation (MNA)

Monitored Natural Attenuation (MNA) requires monitoring of COCs as well as other site-specific groundwater parameters, to assess the effectiveness of subsurface microbial processes at converting the parent compounds (PCE,TCE) to the daughter products (e.g., cis/trans DCE, 1,1-DCE, VC) and innocuous end products. It could take decades to achieve remedial goals, but periodic groundwater sampling would be conducted to monitor effectiveness. The estimated total cost for the MNA alternative would be ~\$280,000.

Alternative 3 – In-Situ Chemical Reduction (ISCR) and Monitored Natural Attenuation (MNA)

The in-situ chemical Reduction (ISCR) alternative involves injection of reducing agents that help change the contaminants into less toxic forms. ISCR should create strong reducing conditions conducive to reductive dichlorination. The strong reducing conditions created by this alternative may generate daughter products that accumulate prior to complete attenuation. This alternative consists of injecting a reducing agent in select locations

where concentrations of CoCs are above their MCLs. For five (5) years, post treatment confirmation sampling and analysis would be conducted to evaluate if the cleanup goals have been achieved. If not achieved, injection events would be implemented. The estimated total cost for in-situ chemical reduction would be ~\$1,500,000.

Alternative 4 – In-Situ Chemical Reduction (ISCR), Enhanced Bioremediation (EB) and Monitored Natural Attenuation (MNA)

In-situ chemical Reduction (ISCR), enhanced bioremediation (EB) and monitoring natural attenuation (MNA) will involve injection of a specific ISCR reducing agent to the area of contamination, which will help change the contaminants into less toxic forms, then implementing EB following ISCR, or in conjunction with ISCR. MNA would allow a determination of the effectiveness of this alternative and if additional treatment is required. The estimated total cost of the ISCR, EB and MNA alternative would be ~\$1,700,000.

EVALUATION OF ALTERNATIVES

The National Contingency Plan requires SCDES to use specific criteria to evaluate and compare the different remediation alternatives individually and against each other to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the criteria, noting how it compares to the other options under consideration. The criteria are:

1. Overall protection of human health and the environment;
2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs);
3. Long-term effectiveness and permanence;
4. Reduction of toxicity, mobility, or volume through treatment
5. Short-term effectiveness;
6. Implementability;
7. Cost; and
8. Community acceptance

The main objective for the preferred remedial action is to be protective of human health and the environment and to comply with State and Federal laws and regulations. These two objectives are considered threshold criteria. Threshold criteria are requirements each alternative must meet in order to be considered for selection.

The following measures are considered balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. These criteria are used to weigh the technical feasibility, strengths and weaknesses, and cost advantages and disadvantages of each alternative.

Community acceptance of the cleanup alternative is a modifying criterion that will be carefully considered by SCDES prior to final remedy selection.

COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of each alternative was performed and can be observed in the EPA Performance Criteria table included. The alternatives were evaluated in relation to one another for each of the evaluation criteria. The purpose of the analysis is to identify the relative advantages and disadvantages of each alternative.

Overall Protection of Human Health and the Environment

When evaluating alternatives in terms of overall protection of human health and the environment, consideration is given to the way site-related risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Alternative 1 and Alternative 2 do not provide adequate protection of human health and the environment as they do not control or reduce the groundwater contamination at the Site. Alternative 3 (ISCR & MNA) and alternative 4 (ISCR, EB & MNA) received a high score for this criterion because they reduce the potential of exposure to chemical of concerns (CoCs) and control down gradient migration of CoCs.

Compliance with ARARs (Applicable or Relevant and Appropriate Requirements)

This evaluation criterion evaluates whether an alternative meets federal and state environmental statutes and regulations that pertain to the site. Each alternative is evaluated with respect to its ability to comply with such requirements. All of the alternatives listed would require a period of natural attenuation for the groundwater downgradient of the treatment area to reach regulatory limits. All of the alternatives received high to moderate scores

for meeting the chemical specific ARARs, with the exception of Alternative 1 and Alternative 2. Alternative 1 and Alternative 2 received the lowest score because regulatory limits would not be achieved in a timely manner.

Long-Term Effectiveness and Permanence

This criterion requires an evaluation of the potential long-term risks remaining after implementation of the remedy. Issues addressed for each alternative include the magnitude of long-term risks and the long-term reliability of the management controls.

Each of the various remedial alternatives can be expected to achieve some level of contaminant reduction and effectiveness, but over widely varying timeframes. The anticipated timeframes for Alternative 1 (No Action) and Alternative 2 (MNA) would be significantly greater than for the active treatment alternatives. Because these alternatives do not involve an active treatment component, they will have poor long-term effectiveness. Alternative 1 and Alternative 2 ranked low for long-term effectiveness.

Alternatives 3 (ISCR & MNA) and Alternatives 4 (ISCR, EB & MNA) each have an active treatment component that would reduce the timeframe to reach remedial goals, thus ranking them higher for this criterion.

Reduction of Toxicity, Mobility, or Volume through Treatment (TMV)

This criteria measures the degree to which an alternative employs treatment to reduce the harmful effects of contaminants, their ability to move in the environment, and the volume of contamination.

Alternative 1 (No Action) and Alternative 2 (MNA) received lowest ranking because they do not include active treatment of contamination. Alternatives 3 (ISCR & MNA) and Alternative 4 (ISCR, EB & MNA) received high scores due to the treatment significantly reducing the toxicity, mobility and volume of contaminants.

Short-Term Effectiveness

The short-term effectiveness evaluation takes into consideration any risk the alternative poses to on-site workers, the surrounding community, or the environment until cleanup targets have been met, as well as the length of time needed to implement the alternative.

Alternative 1 (No Action) and Alternative 2 (MNA) received low scores due to the inability to protect human health and the environment in the short-term period. Alternatives 3 (ISCR & MNA) and Alternative 4 (ISCR, EB & MNA) received the highest scores to the short-term effectiveness due to treating the CoCs with chemically reducing agents that will reduce the concentrations in a shorter time period.

Implementability

The analysis of implementability considers the technical and administrative feasibility of remedy implementation, as well as the availability of required materials and services needed for implementation.

Alternative 1 (No Action) and Alternative 2 (MNA) received moderate scores due to being able to implement the alternatives fairly easily since active remediation is a part of them, however these alternatives would not meet the primary evaluation criteria. Alternative 3 (ISCR & MNA) and Alternative 4 (ISCR, EB & MNA) received the highest score due to the technology being widely used and safe practices for distribution have been well established. Any issues with implementability of Alternative 3 or 4 can be addressed in the planning and design phase of the remedy.

Cost

The following table presents the probable cost for each alternative:

Alternative	Cost
1. No Action	\$0
2. Monitored Natural Attenuation	\$280,000
3. ISCR and MNA	\$1,500,000
4. ISCR, EB, and MNA	\$1,700,000

Community Acceptance

Community acceptance of the preferred remedy will be evaluated after the public comment period. Public comments will be summarized, and responses provided in the Responsiveness Summary Section of the Record of Decision document that will present the SCDES's final alternative selection. SCDES may choose to modify the preferred alternative or select another remedy based on public comments or new information.

SUMMARY OF THE DEPARTMENT'S PREFERRED ALTERNATIVE

SCDES has identified a preferred alternative to address the contamination in the groundwater at the Site. The preferred remedial alternative is Alternative 4, in-situ chemical reduction (ISCR), enhanced bioremediation (EB), and monitored natural attenuation (MNA).

Alternative 4, the ISCR treatment will initially reduce the plume by chemical reduction which will reduce the target CoCs at the injection site. Due to the chemical reduction, its by-product is a graduated lowering of oxidation reduction potential (ORP) from the injection point. Once the reductant is spent, the ORP in the groundwater may rise to background levels and stall the reductive dechlorination process. By introducing an EB to the plume, it will help prolong the lowering of the ORP in the groundwater and drive further reductive dechlorination of the daughter products to harmless end products over the long term. Implementing EB following ISCR or in conjunction with ISCR is a very practical approach to reducing the CVOCs at this Site.

The initial ISCR and EB treatment event would occur in the first year, followed by an extended period of performance monitoring to observe and document the extent and influence of the applied treatment. Annual groundwater monitoring would be conducted at the site to ensure the progress of the treatment and institutional controls (i.e. Land use restrictions) would be implemented at this Site. This alternative will have a five-year review post treatment to demonstrate that cleanup goals have been achieved, if not achieved, then injection events would be implemented in the areas that are not progressing.

The total estimated net present worth of this alternative combination is approximately \$1,700,000. It is the Department's judgment that the Preferred Alternative identified in this Proposed Plan is necessary to protect public health and the environment.

[illegible]

Name _____ Telephone _____

Address _____ Email _____

City _____

State _____ Zip _____

Alternatives 1-5 are compared against each other for groundwater cleanup. The final remedy will be a combination of remedies to address both medias. The tables below rank the alternatives from 0-5 based off their effectiveness for each category with 1 being the lowest score and 5 being the highest score. The remedy with the highest total score is considered the best alternative for each media.

Comparative analysis of Alternatives Table:

Criterion	Alternative 1 No Action	Alternative 2 Monitored Natural Attenuation	Alternative 3 ISCR & MNA	Alternative 4 ISCR, EB, & MNA
Protection Human Health and the Environment	1	2	5	5
Compliance with ARARs	1	2	5	5
Short-Term Effectiveness	1	1	3	5
Long-Term Effectiveness	1	2	5	5
Reduction of toxicity, mobility, & volume through Treatment	1	1	4	5
Implementability	5	5	3	3
Costs	5	3	2	1
Total Score	15	16	27	29